

Calculating Headloss – Practice Problem Answer

What is the total headloss for 1.5 miles of 12-inch pipeline if the C-Factor is 100, the flow rate is 320 gpm, and there is a 47-foot incline or elevational change?

FRICITION LOSS OF WATER IN FEET PER 100 FEET LENGTH OF PIPE. BASED ON WILLIAM & HAZEN FORMULA USING CONSTANT 100. SIZES OF STANDARD PIPE IN INCHES

U.S. Gals. Per Min.	1/2" Pipe		3/4" Pipe		1" Pipe		1 1/4" Pipe		1 1/2" Pipe		2" Pipe		2 1/2" Pipe		3" Pipe		4" Pipe		5" Pipe		6" Pipe		U.S. Gals. Per Min.
	Vel. ft. per Sec.	Loss in feet	Vel. ft. per Sec.	Loss in feet	Vel. ft. per Sec.	Loss in feet	Vel. ft. per Sec.	Loss in feet	Vel. ft. per Sec.	Loss in feet	Vel. ft. per Sec.	Loss in feet	Vel. ft. per Sec.	Loss in feet	Vel. ft. per Sec.	Loss in feet	Vel. ft. per Sec.	Loss in feet	Vel. ft. per Sec.	Loss in feet	Vel. ft. per Sec.	Loss in feet	
240	1.53	.22	.98	.07	.....	.....	.....	.....	.....	.....	24.51	182.0	15.69	61.0	10.89	25.1	6.13	6.2	3.92	2.08	2.72	.87	240
260	1.66	.25	1.06	.08	.....	.....	.....	.....	.....	.....	26.55	211.0	16.99	70.0	11.80	29.1	6.64	7.2	4.25	2.41	2.95	1.00	260
280	1.79	.28	1.15	.09	.....	.....	.....	.....	.....	.....	.....	.....	18.30	81.0	12.71	33.4	7.15	8.2	4.58	2.77	3.18	1.14	280
300	1.91	.32	1.22	.11	.....	.....	.....	.....	.....	.....	.....	.....	19.61	92.0	13.62	38.0	7.66	9.3	4.90	3.14	3.40	1.32	300
320	2.05	.37	1.31	.12	.....	.....	.....	.....	.....	.....	.....	.....	20.92	103.0	14.52	42.8	8.17	10.5	5.23	3.54	3.64	1.47	320
340	2.18	.41	1.39	.14	.....	.....	.....	.....	.....	.....	.....	.....	22.22	116.0	16.43	47.9	8.68	11.7	5.54	3.97	3.84	1.62	340

Total Head = Elevational Head + Velocity Head

7,920 feet of pipe for the 1.5 miles

Dividing the entire length of pipe needed by 100-foot sections, gives you 79.2 100-foot sections.

So $79.2 \times .12 = 9.5$ feet

47 feet of elevational head + 9.5 feet friction head = 56.5 feet of head total

56.5 feet of head $\times .433 = 24.47$ psi.